PATENT CLAIMS

1. A apparatus for an intermittent feeding of a strip shaped blank to a press equipped with tools for a intermittent working of the strip shaped blank said feeding apparatus having a housing, a first feeding roller and a second feeding roller, which feeding rollers are adapted to accommodate the strip shaped blank arranged between same to be fed, and having a first intermittently operating electric servomotor which is drivingly connected to at least said first feeding roller, which first feeding roller includes a longitudinal center axis and is designed symmetrically relative to a plane of symmetry extending perpendicularly to said longitudinal center axis; and having further a elongate rocker which includes a first end and a second end which second end is located opposite said first end; which first feeding roller is supported for rotation in said rocker; which second feeding roller is arranged on a roller shaft and is rigidly connected thereto; which rocker is arranged at its first end on a first end area of a rocker shaft and is rigidly connected thereto; which rocker shaft is mounted for rotation at a second end area opposite the first end area in said housing so that said rocker is supported in a overhung state; further having a means for a lifting off of a feeding roller, which means include a control rod which is pivotally mounted to said second end of said rocker, which control rod includes a longitudinal center axis; further having a feeding roller pressing on device which includes a spiral pressing spring which rests at one of its ends on said rocker; which spiral pressing spring includes a further longitudinal centre axis;

wherein said control rod which is pivotally mounted to said rocker and said spiral spring which rests on

said rocker and said first feeding roller are arranged relative to each other in such positions, that said longitudinal center axis of said control rod and said longitudinal center axis of said spiral pressure spring define a geometrical plane which coincides with said plane of symmetry of said first feeding roller.

2. The feeding apparatus of claim 1, wherein said first end of said elongate rocker is of a forked design having two fork tines; which fork tines are designed symmetrically relative to a longitudinal plane of symmetry of said elongate rocker; and wherein said elongate rocker is arranged relative to said control rod, said spiral pressing spring and said first feeding roller in such a manner, that its plane of symmetry coincides also with said geometrical plane which coincides with said plane of symmetry of said first feeding roller.

3. The feeding apparatus of claim 1, comprising a threaded spindle housing located on said housing; further comprising a adjusting motor, a threaded spindle, a control apparatus and a adjusting nut arranged on said threaded spindle and adapted to be displaced along said threaded spindle by a rotating of said threaded spindle; and comprising a eccentric disk which is driven by a electromotor, and a connecting rod supported on said eccentric disk, which connecting rod includes at a end remote from said eccenter disk a oblong hole extending at least approximately parallel to said threaded spindle; further comprising a first double arm lever device which is supported on said adjusting nut, and a second double arm lever device supported on a shaft which in turn is supported in said threaded spindle housing; which first double arm lever device includes a first arm and a second arm, which first arm engages said connecting rod and which said second arm is pivotally mounted to a fishplate which in turn

is pivotally mounted to a first arm of said second double arm lever device which has a second arm which is pivotally mounted to a control rod unit which is pivotally mounted to said rocker; and comprising a pressure spring located between said rocker and said threaded spindle housing and adapted to press said rocker with a upper roller shaft supported in same and supporting said upper feeding roller against said lower feeding roller shaft with said second lower feeding roller.

4. The feeding apparatus of claim 3, wherein said threaded spindle is supported through roller bearings free of play in said threaded spindle housing and said housing, wherewith said threaded spindle is precisely positioned.

5. The feeding apparatus of claim 4, wherein said adjusting motor is drivingly coupled to said threaded spindle through a multi-part clamping sleeve followed by a jaw clutch coupling.

6. The feeding apparatus of claim 3, wherein said second arm f said second double arm lever device is pivotally mounted through a ball end connection to said control rod which forms a part of said control rod unit.

7. The feeding apparatus of claim 6, wherein said second shaft supported in said threaded spindle housing is sealed against lubrication oil leakage by sealing rings oil tight against said threaded spindle housing, wherewith said threaded spindle housing forms a closed oil chamber.

8. The feeding apparatus of claim 7, wherein said control rod unit includes rod portions which are threaded together allowing a length adjustment of said control rod unit.

9. The feeding apparatus of claim 3, wherein said first arm of said first double arm lever device engages said connecting rod through a bolt which projects through said oblong hole.

10. The feeding apparatus of claim 1, wherein said second end area of said rocker shaft is of a converging shape and has a first portion facing said first end area and a second portion remote from said end area, which first portion has a larger diameter than the second portion and the first portion is supported in said housing by a first roller bearing and said second portion is supported in said housing by a second roller bearing.

11. The feeding apparatus of claim 2, wherein said rocker is mounted at its fork tines by means of a clamped mounting to the first end area of said rocker shaft, for which reason each fork tine includes a slotted end area in which a threaded bolt is received.

12. A twin feeding apparatus, comprising two apparatuses according to claim 1, which apparatuses face each other at their sides having said first and second feeding rollers.

13. A method of operating the feeding apparatus of claim 1, said feeding apparatus having a housing and a threaded spindle housing arranged on said housing; having a adjusting motor with a threaded spindle and a control apparatus, a adjusting nut arranged on said threaded spindle and displaceable along same by a rotating of said threaded spindle; having further a eccenter disk driven by a electromotor, on which eccenter disk a connecting rod is supported which at its end remote from said eccenter disk includes a oblong hole extending at least approximately parallel to said threaded spindle; having further a double arm lever device supported on said adjusting nut, and a second double arm lever device supported on a shaft which is supported in said threaded spindle housing; which first double arm lever device has a first arm which engages said connecting rod and a second arm which is pivotally mounted to a fishplate which in turn is

pivotally mounted to a first arm of said second double arm lever device, onto a second arm of which a connecting rod unit is pivotally mounted which in turn is pivotally mounted to said rocker; having further a pressure spring located between said rocker and said threaded spindle housing and is adapted to press said rocker with a upper roller shaft supported therein and with the first, upper feeding roller against said lower roller shaft with the second, lower feeding roller; said feeding apparatus having a control device and a stationary lower tool, which upper tool is mounted to a punch which is moveable between a upper dead center position and a bottom dead center position; and having a press control device which cooperates with said control device of the feeding apparatus; and in which the oblong hole of the connecting rod which is moveable between a upper dead center position and a bottom dead center position has a upper and a lower end; and in which the first arm of said first double arm lever device engages said connecting rod through a bolt which extends through said oblong hole, wherein in order to insert a new strip shaped blank between said upper feeding roller and said lower feeding roller, the upper feeding roller is moved into a high lift position in order to set in this position a predetermined distance (D) between the upper feeding roller and the lower feeding roller;

wherein in order to set said high lift position of said upper feeding roller the two said control devices are controlled such, that the punch is controlled into its upper dead center position and the punch is controlled into its bottom dead center position.

14. The method of claim 13, wherein said punch is kept stationary and said adjusting nut is lowered during the stationary state of said punch by a rotating of said threaded spindle, wherewith said bolt rests due to the force exerted

by said pressure spring and transmitted through said rocker and said double arm lever device with their arms onto the bottom end of said oblong hole, so that the first arm of said first double arm lever device is pivoted upwards and its second arm is pivoted downwards, said first arm of said second double arm lever device is pivoted downwards, conclusively the control rod unit is lifted due to these pivoting movements, and accordingly said rocker with the upper feeding roller supported therein is pivoted into the high lift position of said upper feeding roller.

15. A method of operating the feeding apparatus of claim 1, said feeding apparatus having a housing and a threaded spindle housing arranged on said housing; having a adjusting motor with a threaded spindle and a control apparatus, a adjusting nut arranged on said threaded spindle and displaceable along same by a rotating of said threaded spindle; having further a eccenter disk driven by a electromotor, on which eccenter disk a connecting rod is supported which at its end remote from said eccenter disk includes a oblong hole extending at least approximately parallel to said threaded spindle; having further a double arm lever device supported on said adjusting nut, and a second double arm lever device supported on a shaft which is supported in said threaded spindle housing; which first double arm lever device has a first arm which engages said connecting rod and a second arm which is pivotally mounted to a fishplate, which in turn is pivotally mounted to a first arm of said second double arm lever device, onto a second arm of which a connecting rod unit is pivotally mounted which in turn is pivotally mounted to said rocker; having further a pressure spring located between said rocker and said threaded spindle housing and is adapted to press said rocker with a upper roller shaft supported therein and with the first, upper feeding roller sup-

ported therein against said lower roller shaft with the second, lower feeding roller; said feeding apparatus having a control device and cooperates with a press having a moveable upper tool and a stationary lower tool, which upper tool is mounted to a punch which is moveable between a upper dead center position and a bottom dead center position; and having a press control device which cooperates with said control device of the feeding apparatus; and in which the oblong hole of the connecting rod which is moveable between a upper dead center position and a bottom dead center position has a upper an a lower end; and in which the first arm of said first double arm lever device engages said connecting rod through a bolt which extends through said oblong hole;

wherein said connecting rod is moved into a position which is remote from its upper dead center position; the adjusting nut is displaced downwards by a rotating of said threaded spindle until said upper feeding roller rests on said strip-shaped blank due to the pressure exerted by said pressing spring onto said rocker, in which position said bolt is at a distance from both ends of said oblong hole, whereby lifting movements of said connecting rod during a stationary state of said bolt are possible.

16. A method of operating the feeding apparatus of claim 1, said feeding apparatus having a housing and a threaded spindle housing arranged on said housing; having a adjusting motor with a threaded spindle and a control apparatus, a adjusting nut arranged on said threaded spindle and displaceable along same by a rotating of said threaded spindle; having further a eccenter disk driven by a electromotor, on which eccenter disk a connecting rod is supported which at its end remote from said eccenter disk includes a oblong hole extending at least approximately parallel to said threaded spindle; having further a double arm lever device supported

on said adjusting nut, and a second double arm lever device supported on a shaft which is supported in said threaded spindle housing; which first double arm lever device has a first arm which engages said connecting rod and a second arm which is pivotally mounted to a fishplate, which in turn is pivotally mounted to a first arm of said double arm lever device, onto a second arm of which a connecting rod unit is pivotally mounted which in turn is pivotally mounted to said rocker; having further a pressure spring located between said rocker and said threaded spindle housing and is adapted to press said rocker with a upper roller shaft supported therein and the first, upper feeding roller supported therein against said lower roller shaft with the second lower feeding roller; said feeding apparatus having a control device and cooperates with a press having a moveable upper tool and a stationary lower tool, which upper tool is mounted to a punch which is moveable between a upper dead center position and a bottom dead center position; and having a press control device which cooperates with said control device of the feeding apparatus; and in which the oblong hole of the connecting rod which is moveable between a upper dead center position and a bottom dead center position has an upper and a lower end; and in which the first arm of said first double arm lever device engages said connecting rod through a bolt which extends through said oblong hole; which punch is driven by a rotating drive and the eccenter disk of the connecting rod is driven by a electromotor; which upper tool includes positioning pins adapted to precisely position said strip shaped blank in the press during any working procedure step performed on the strip; which positioning pins are moved into prepunched positioning holes in said strip shaped blank, and which positioning pins include conical head portions, and said first, upper feeding roller is moved away from said second, lower feeding

roller into a intermediate lifted position as soon as said conical head portions have been moved partly into the positioning holes, and thereafter moved again back to again rest on the strip shaped blank as soon as the conical head portions have been lifted partly out of the positioning holes;

wherein in order to set the position of said intermediate lifted position said punch is moved by its rotating drive into a angular position ahead of its bottom dead center position, in which angular position said conical head portions of said positioning pins are immersed only partly in the positioning holes, in which state the eccenter disk of said connecting rod is in a position ahead of its upper dead center position, in which state the angular distance of the punch between said its angular position and its bottom dead center position equals the angular distance of the eccentric disk between said its angular position and its upper dead center position; thereafter said adjusting nut is moved downwards so that said bolt comes to rest against the bottom end of said oblong hole and said adjusting nut is moved still further downwards until said strip shaped blank becomes loose due to the lifting off of the first upper feeding roller due to the movement transmitted through the double arm lever devices and said control rod unit and said rocker, and wherein the thereby reached position of said adjusting nut for said angular position of the eccenter disk and the corresponding angular position of the ram are stored in the respective control devices.